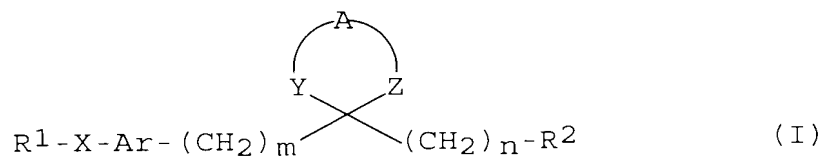


IN THE CLAIMS

Please amend the claims as follows:

Claims 1-9 (Canceled).

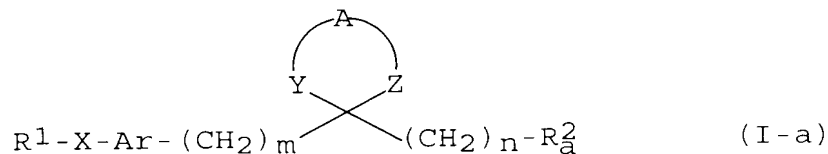
Claim 10 (Currently amended): A process for the preparation of a compound of the formula:



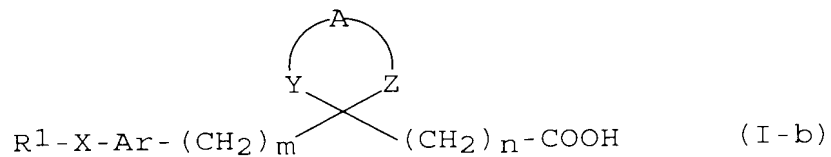
in which R^1 , R^2 , Ar, A, X, Y, Z, m and n are each as defined in Claim 4 18,

which comprises

(1) subjecting a compound of the formula:

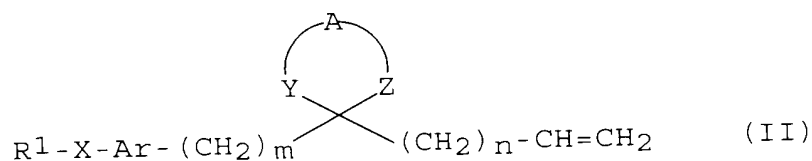


or a salt thereof to removal reaction of the carboxy-protective group, to give a compound of the formula:



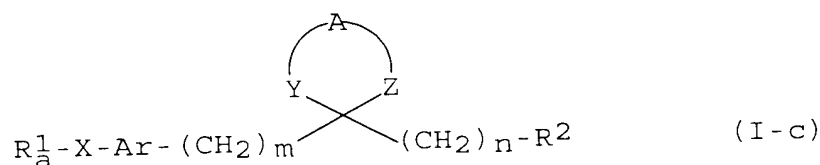
or a salt thereof; or

- (2) oxidating the vinyl group of a compound of the formula:

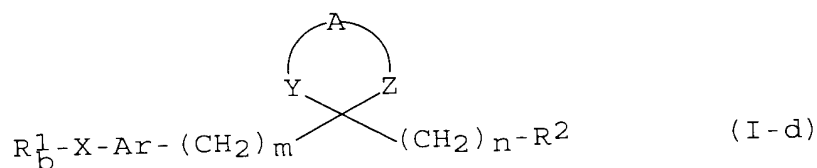


or a salt thereof, to give a compound of the above formula (I-b) or a salt thereof; or

- (3) reducing a compound of the formula:



or a salt thereof, to give a compound of the formula:



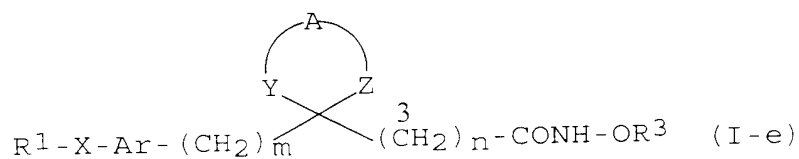
or a salt thereof; or

- (4) reacting a compound of the above formula (I-b) or its reactive derivative at the carboxy-group, or a salt thereof, with a compound of the formula:



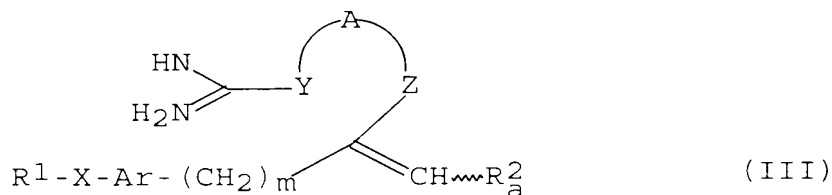
or its reactive derivative at the amino-group,

or a salt thereof, to give a compound of the formula:

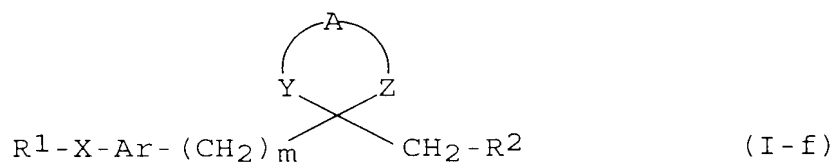


or a salt thereof; or

(5) cyclizing a compound of the formula:

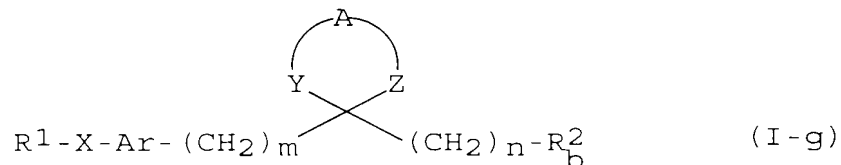


or a salt thereof, to give a compound of the formula:



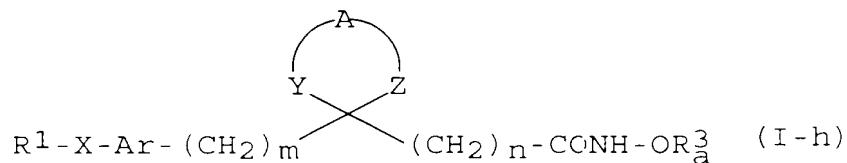
or a salt thereof; or

(6) reacting a compound of the above formula (I-b) or its reactive derivative at the carboxy-group, or a salt thereof, with an optically active amine or its reactive derivative at the amino-group, or a salt thereof, to give a compound of the formula:

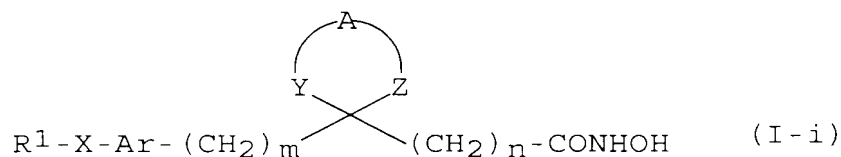


or a salt thereof; or

(7) subjecting a compound of the formula:

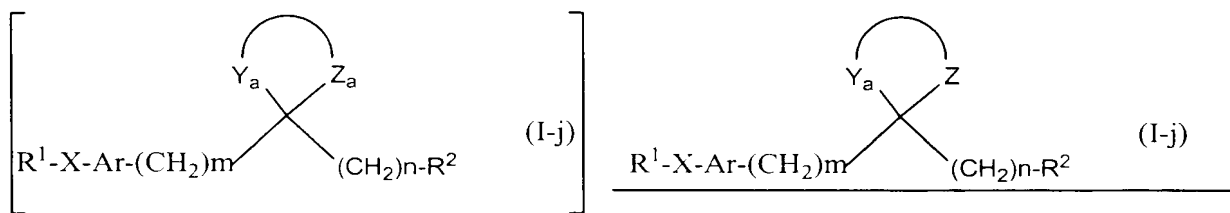


or a salt thereof to removal reaction of the hydroxy-protective group, to give a compound of the formula:

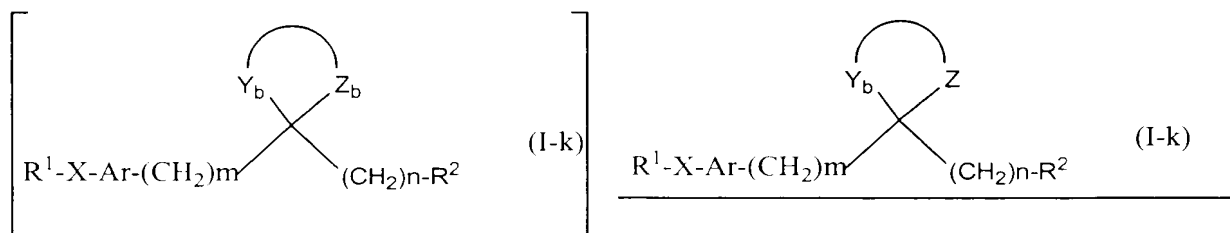


or a salt thereof; or

(8) oxidating a compound of the formula:



or a salt thereof, to give a compound of the formula:

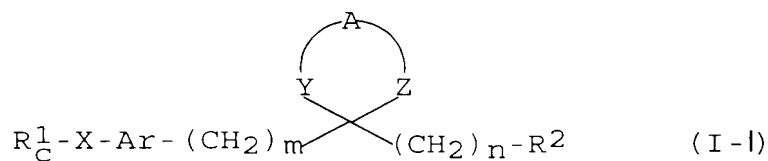


or a salt thereof; or

- (9) reacting a compound of the above formula (I-c)
 or a salt thereof, with a compound of the formula:



to give a compound of the formula:

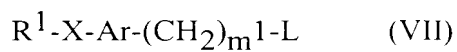


or a salt thereof; or

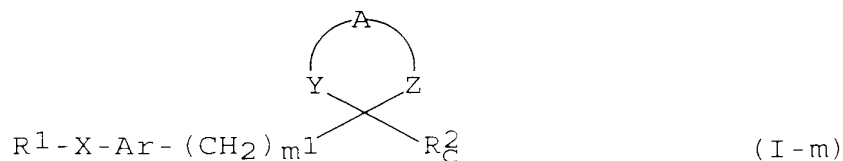
- (10) reacting a compound of the formula:



or a salt thereof, with a compound of the formula:

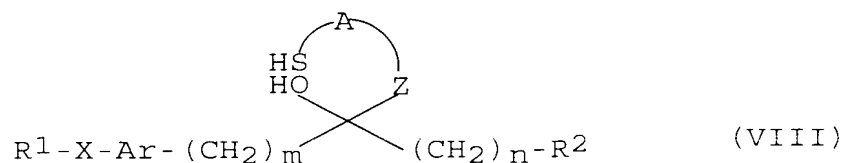


or a salt thereof, to give a compound of the formula:

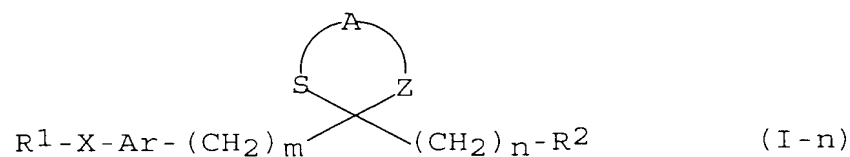


or a salt thereof; or

(11) cyclizing a compound of the formula:

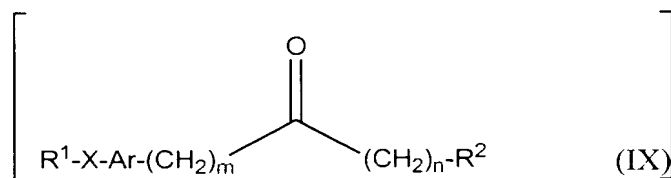


or a salt thereof, to give a compound of the formula:

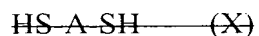


or a salt thereof; or

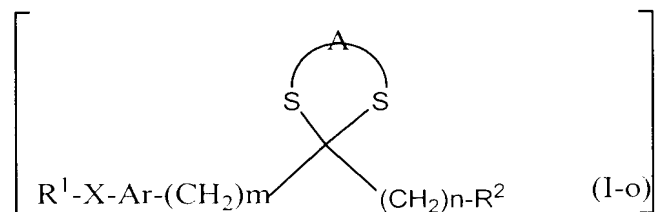
(12) reacting a compound of the formula:



or a salt thereof, with a compound of the formula:

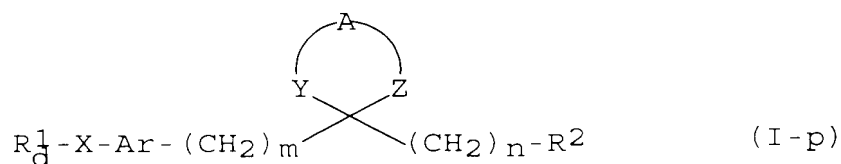


to give a compound of the formula:



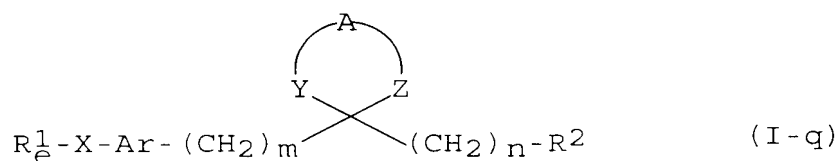
or a salt thereof; or

(13) (12) amidating a compound of the formula:



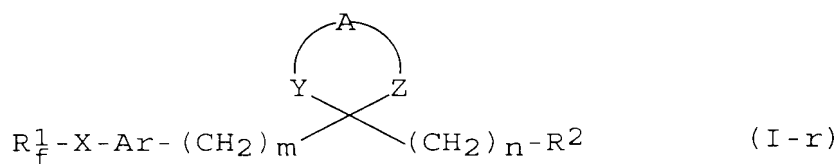
or its reactive derivative at the carboxy group,

or a salt thereof, to give a compound of the formula:



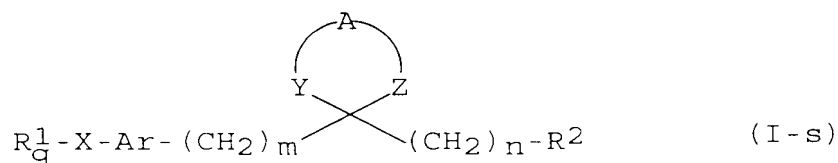
or a salt thereof; or

(14) (13) acylating a compound of the formula:



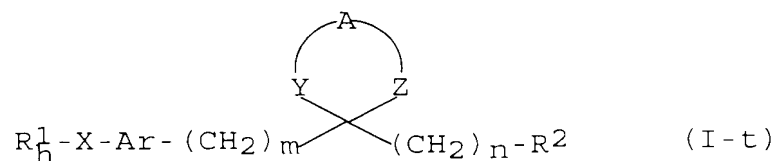
or its reactive derivative at the amino group,

or a salt thereof, to give a compound of the formula:

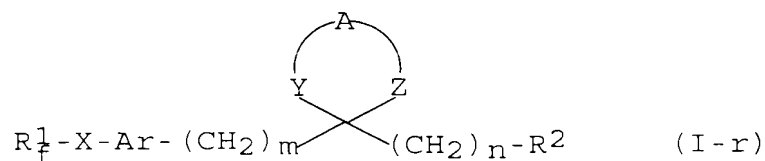


or a salt thereof; or

(15) (14) subjecting a compound of the formula:

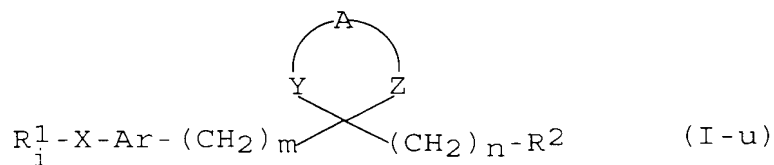


or a salt thereof to a removal reaction of the amino-protective group, to give a compound of the formula:

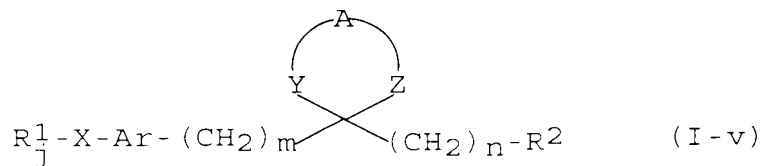


or a salt thereof; or

(16) (15) subjecting a compound of the formula:

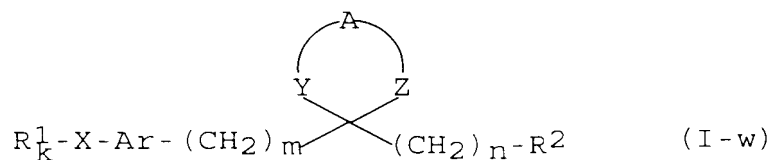


or a salt thereof to a removal reaction of the hydroxy-protective group, to give a compound of the formula:

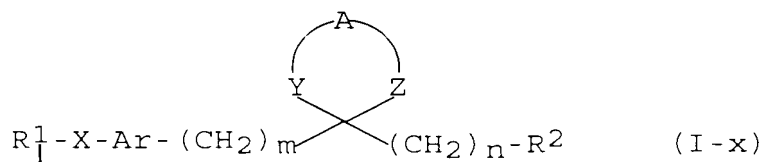


or a salt thereof; or

(47) (16) oxidating a compound of the formula:

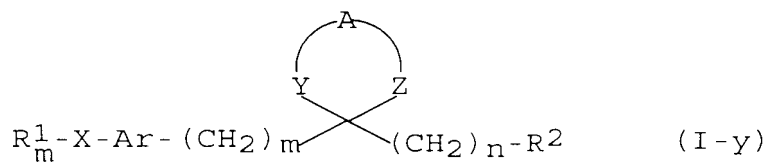


or a salt thereof, to give a compound of the formula:

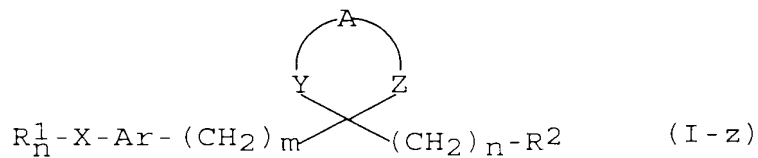


or a salt thereof; or

(48) (17) reducing a compound of the formula:

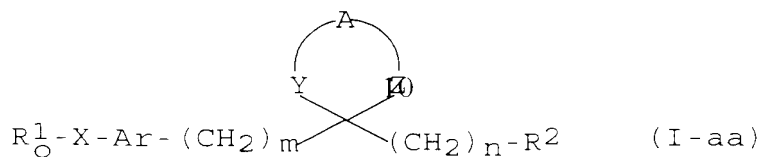


or a salt thereof, to give a compound of the formula:

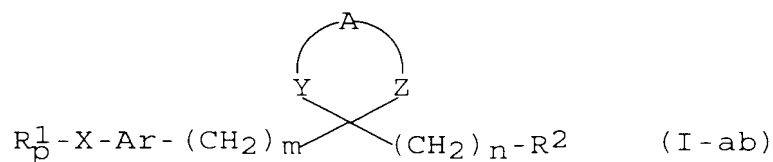


or a salt thereof; or

(49) (18) oxidating a compound of the formula:

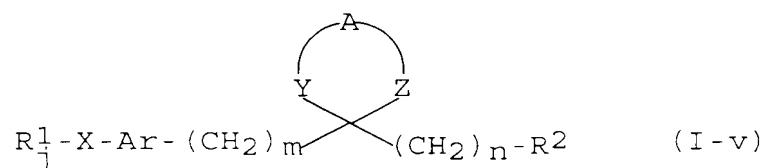


or a salt thereof, to give a compound of the formula:

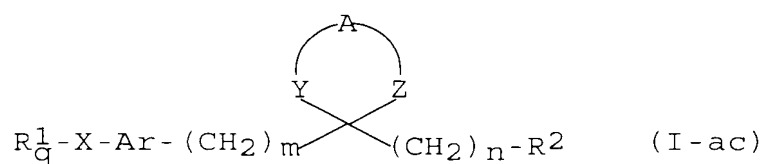


or a salt thereof; or

(20) (19) acylating a compound of the formula:

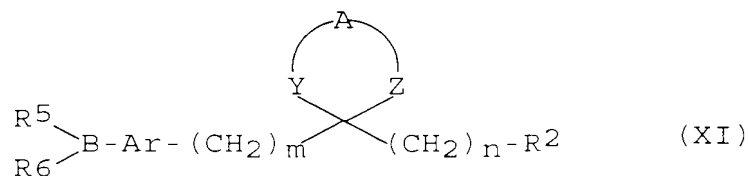


or a salt thereof, to give a compound of the formula:



or a salt thereof; or

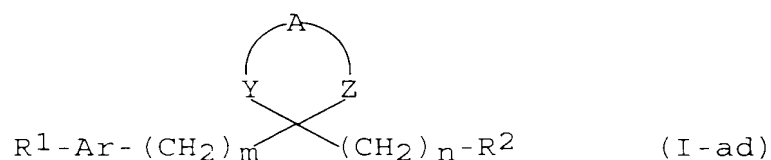
(21) (20) reacting a compound of the formula:



or a salt thereof, with a compound of the formula:

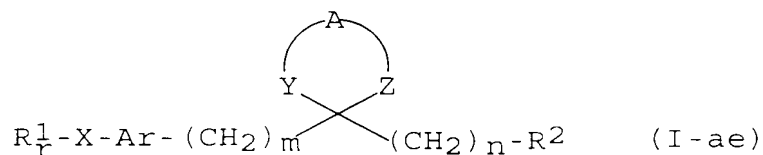


or a salt thereof, to give a compound of the formula:

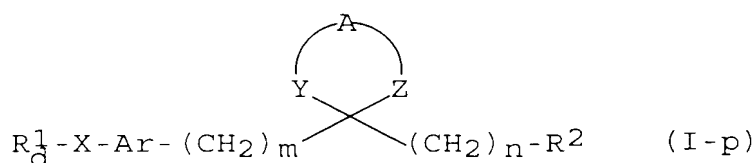


or a salt thereof; or

~~(22)~~ (21) subjecting a compound of the formula:

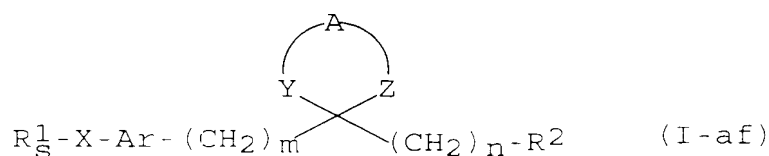


or a salt thereof, to a removal reaction of the carboxy-protective group, to give a compound of the formula:

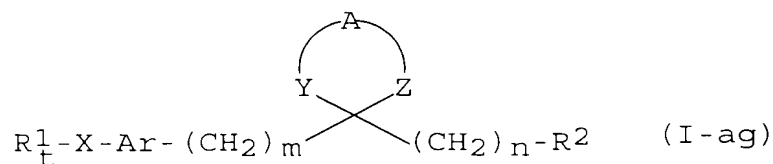


or a salt thereof; or

~~(23)~~ (22) reacting a compound of the formula:



or a salt thereof, with a substituted amine, to give a compound of the formula:



or a salt thereof,

in which R^1 , R^2 , Ar, A, X, Y, Z, m and n are each as defined above,

R_a^1 is haloaryl or halo,

R_b^1 is aryl,

R_c^1 is aryl at least substituted by optionally substituted aryl,

R_d^1 is aryl at least having carboxy moiety,

R_e^1 is aryl at least having amido moiety,

R_f^1 is aryl at least having amino moiety,

R_g^1 is aryl at least having acylamino moiety,

R_h^1 is aryl at least having protected amino moiety,

R_i^1 is aryl at least having protected hydroxy moiety,

R_j^1 is aryl at least having hydroxy moiety,

R_k^1 is aryl at least having thia moiety,

R_l^1 is aryl at least having sulfinyl or

sulfonyl moiety,

R_m^1 is aryl at least having formyl moiety,

R_n^1 is aryl at least having hydroxymethyl moiety,

R_o^1 is aryl at least having vinyl moiety,

R_p^1 is aryl at least having 1,2-dihydroxyethyl moiety,

R_q^1 is aryl at least having acyloxy moiety,

R_r^1 is aryl at least having protected carboxy moiety,

R_s^1 is aryl at least having halo(lower)alkanoyl moiety,

R_t^1 is aryl at least having substituted amino(lower)alkanoyl moiety,

R_a^2 is protected carboxy,

R_b^2 is optically active amide,

R_c^2 is protected carboxy,

R^3 is hydrogen or hydroxy-protective group,

R_a^3 is hydroxy-protective group,

R^4 is optionally substituted aryl,

R_5 and R_6 are each hydrogen or combined together to form lower alkylene,

Y_a is thia, or sulfinyl ~~or sulfonyl~~,

~~Z_a is methylene, thia, sulfinyl or sulfonyl, provided that at least one of~~

~~Y_a and Z_a is thia or sulfinyl,~~

Y_b is ~~thia~~, sulfinyl or sulfonyl,

~~Z_b is methylene, thia, sulfinyl or sulfonyl, provided that at least one of~~

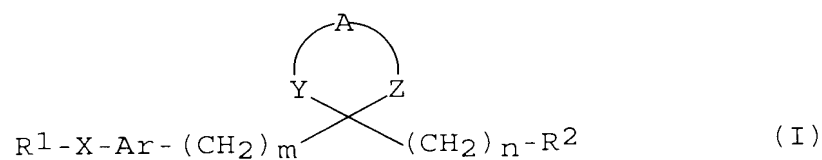
—Y_b and Z_b is fulfinyl or sulfonyl,

L is a leaving group, and

m¹ is an integer of 1 to 6.

Claims 11-17 (Canceled).

Claim 18 (Previously added): A compound of the formula:



in which R¹ is lower alkyl, halogen, optionally substituted heterocyclic group or optionally substituted aryl,

R² is carboxy, protected carboxy or amidated carboxy,

Ar is thienyl,

A is ethylene or trimethylene,

X is oxa or a single bond,

Y is thia, sulfinyl or sulfonyl,

Z is methylene,

m and n are each an integer of 0 to 6, and

$$1 \leq m+n \leq 6,$$

and its salt.

Claim 19 (Previously added) The compound of claim 18, in which the heterocyclic group of R¹ is selected from the group consisting of:

- (1) unsaturated 3- to 8-membered, heteromonocyclic group containing 1 to 4 nitrogen atoms,
- (2) saturated 3- to 8-membered, heteromonocyclic group containing 1 to 4 nitrogen atoms,
- (3) unsaturated 3- to 8-membered, heteromonocyclic group containing 1 or 2 sulfur atoms,
- (4) unsaturated condensed 7- to 13-membered, heterocyclic group containing 1 to 5 nitrogen atoms,
- (5) unsaturated 3- to 8-membered, heteromonocyclic group containing 1 or 2 oxygen atoms,
- (6) saturated 3- to 8-membered, heteromonocyclic group containing 1 or 2 oxygen atoms,
- (7) unsaturated 3- to 8-membered, heteromonocyclic group containing 1 or 2 oxygen atoms and 1 to 3 nitrogen atoms,
- (8) unsaturated condensed 7- to 13-membered, heterocyclic group containing 1 or 2 oxygen atoms,
- (9) unsaturated condensed 7- to 13-membered, heterocyclic group containing 1 or 2 sulfur atoms,
- (10) saturated 3- to 8-membered, heteromonocyclic group containing 1 or 2 oxygen atoms and 1 to 3 nitrogen atoms,
- (11) unsaturated condensed 7- to 13-membered, heterocyclic group containing 1 or 2 oxygen atoms and 1 to 3 nitrogen atoms,

(12) unsaturated 3- to 8-membered, heteromonocyclic group containing 1 or 2 sulfur atoms and 1 to 3 nitrogen atoms,

(13) saturated 3- to 8-membered, heteromonocyclic group containing 1 or 2 sulfur atoms and 1 to 3 nitrogen atoms, and

(14) unsaturated condensed 7- to 13-membered, heterocyclic group containing 1 or 2 sulfur atoms and 1 to 3 nitrogen atoms, and

the aryl group of R1 is C6-C10 aryl, and further,

each of the above-mentioned heterocyclic group and aryl group are optionally substituted by a group selected from the group consisting of:

(A1) halogen,

(A2) lower alkyl,

(A3) lower alkoxy,

(A4) halo(lower)alkyl,

(A5) halo(lower)alkoxy,

(A6) lower alkenyl,

(A7) acyl,

(A8) lower alkylthio, lower alkylsulfinyl, lower alkylsulfonyl,

(A9) C6-C10 aryl,

(A10) halo(C6-C10)aryl,

(A11) hydroxy,

(A12) hydroxy(lower)alkyl, protected hydroxy(lower)alkyl,

(A13) amino,

(A14) carboxy,

(A15) protected carboxy,

(A16) nitro(lower)alkenyl,

- (A17) lower alkylenedioxy,
- (A18) acylamino,
- (A19) nitro,
- (A20) (C6-C10)aryl(lower)alkoxy,
- (A21) carbamoyl(lower)alkenyl optionally N-substituted by the group consisting of lower alkyl, C6-C10 aryl, lower alkoxy(C6-C10)-aryl, and halo(C6-C10)aryl,
- (A22) lower alkylaminocarbonyloxy,
- (A23) lower alkanoyloxy,
- (A24) lower alkoxy(lower)alkanoyloxy,
- (A25) lower alkoxycarbonyloxy,
- (A26) lower alkenoyloxy optionally substituted by heterocyclic group of the above (1) to (14),
- (A27) lower cycloalkanecarbonyloxy,
- (A28) lower alkoxy substituted by the group consisting of carboxy, protected carboxy, lower alkanoyl, lower cycloalkanecarbamoyl, and lower alkylcarbamoyl,
- (A29) lower alkylcarbamoyloxy(lower)alkyl,
- (A30) lower alkoxycarbonylamino(lower)alkyl,
- (A31) amino(lower)alkyl,
- (A32) lower alkylcarbamoyl(lower)alkyl,
- (A33) heterocyclic-carbonylamino, the heterocyclic group being selected from the above (1) to (14) and optionally being substituted N-protective group,
- (A34) the above heterocyclic groups (1) to (14) being optionally substituted by lower alkyl, and
- (A35) oxo.

Claim 20 (Previously added): The compound of claim 19, in which

R1 is lower alkyl, halogen, optionally substituted heterocyclic group, or aryl selected from the group consisting of phenyl and naphthyl;

R2 is carboxy, lower alkoxy carbonyl, hydroxyaminocarbonyl, tetrahydropyranyloxyaminocarbonyl, or phenyl(lower)alkylaminocarbonyl, and

m and n are each an integer of 0 or 1, and $m+n=1$ or 2,

wherein the heterocyclic group is selected from the group consisting of:

- (1) unsaturated 5- or 6-membered heteromonocyclic group containing 1 to 4 nitrogen atoms,
- (2) saturated 5- or 6-membered, heteromonocyclic group containing 1 to 4 nitrogen atoms,
- (3) unsaturated 5- or 6-membered heteromonocyclic group containing 1 to 2 sulfur atoms,
- (4) unsaturated bicyclic 9- or 10-membered, heterocyclic group containing 1 to 5 nitrogen atoms,
- (5) unsaturated 5- or 6-membered heteromonocyclic group containing 1 to 2 oxygen atoms,
- (6) saturated 5- or 6-membered, heteromonocyclic group containing 1 or 2 oxygen atoms,
- (7) unsaturated 5- or 6-membered, heteromonocyclic group containing 1 or 2 oxygen atoms and 1 to 3 nitrogen atoms,
- (8) unsaturated bicyclic 9- or 10-membered, heterocyclic group containing 1 or 2 oxygen atoms,
- (9) unsaturated bicyclic 9- or 10-membered, heterocyclic group containing 1 or 2 sulfur atoms, or

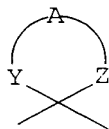
(10) saturated 5- or 6-membered, heteromonocyclic group containing 1 or 2 oxygen atoms and 1 to 3 nitrogen atoms,

wherein the heterocyclic group being optionally substituted by a group selected from the group consisting of the following (B1) to (B8):

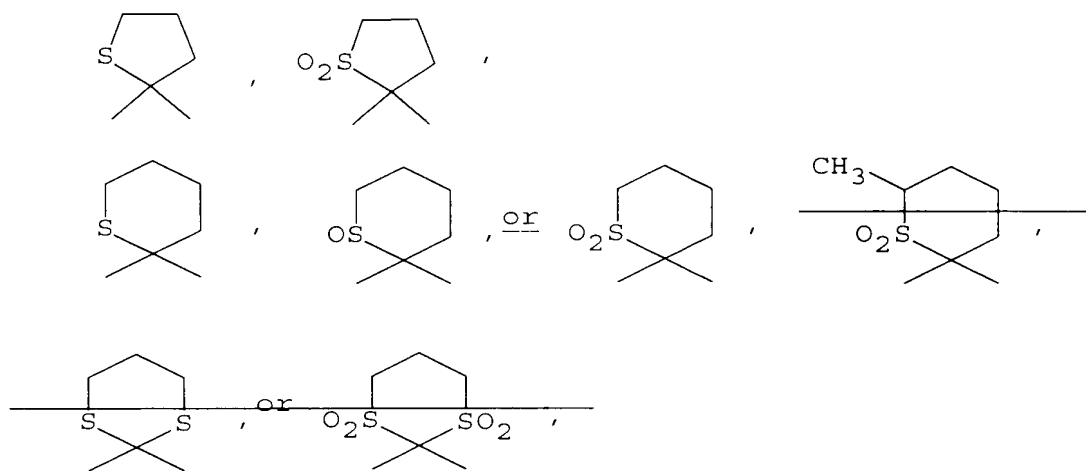
- (B1) lower alkanoyl,
- (B2) lower alkyl,
- (B3) lower alkoxy,
- (B4) lower alkoxycarbonylamino,
- (B5) carbamoyl or lower alkylcarbamoyl,
- (B6) lower alkoxycarbonyl,
- (B7) halo, and
- (B8) oxo;

and the aryl is optionally substituted by a group selected from the group consisting of (A1) to (A35) as defined in claim 19.

Claim 21 (Currently amended): The compound of claim 20, in which
a group of the formula:



is one of the following formulae:



R1 is lower alkyl, halogen, optionally substituted heterocyclic group or aryl selected from the group consisting of phenyl and naphthyl;

R2 is carboxy, lower alkoxy, carbonyl, hydroxyaminocarbonyl, or tetrahydropyranyloxyaminocarbonyl, and

m and n are each an integer of 0 or 1, and m+n=1 or 2,

wherein the above-mentioned heterocyclic group is

- (1) pyrrolyl, pyrrolinyl, imidazolyl, pyrazolyl, pyridyl, pyridyl N-oxide, pyrimidyl, pyrazinyl, pyridazinyl, triazolyl, tetrazolyl, dihydrotriazinyl,
- (2) azetidiny, pyrrolidinyl, imidazolidinyl, piperidinyl, piperidino, pyrazolidinyl, piperazinyl,
- (3) thienyl,
- (4) indolyl, isoindolyl, indoliziny, benzimidazolyl, quinolyl, isoquinolyl, tetrahydroisoquinolyl, indazolyl, benzotriazolyl, tetrazolopyridyl, tetrazolopyridazinyl, dihydrotriazolopyridazinyl,
- (5) furyl,

- (6) oxolanyl,
- (7) oxazolyl, isoxazolyl, oxadiazolyl,
- (8) benzofuranyl, benzodihydrofuranyl, benzodioxolenyl,
- (9) benzothienyl, dihydrobenzothienyl,
- (10) morpholinyl, morpholino,

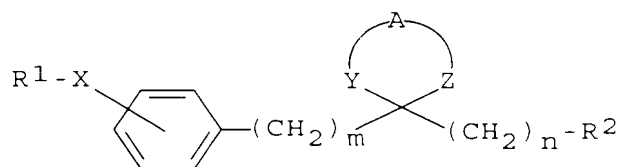
wherein the heterocyclic group being optionally substituted by a group selected from the group consisting of (B1) to (B8) as defined in claim 20,

and the aryl is optionally substituted by a group selected from the group consisting of the following (A1) to (A34):

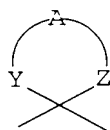
- (A1) halogen,
- (A2) lower alkyl,
- (A3) lower alkoxy,
- (A4) halo(lower)alkyl,
- (A5) halo(lower)alkoxy,
- (A6) lower alkenyl,
- (A7) acyl,
- (A8) lower alkylthio, lower alkylsulfinyl, lower alkylsulfonyl,
- (A9) C6-C10 aryl
- (A10) halo(C6-C10)aryl,
- (A11) hydroxy,
- (A12) hydroxy(lower)alkyl or protected hydroxy(lower)alkyl,
- (A13) amino,
- (A14) carboxy,
- (A15) protected carboxy,
- (A16) nitro(lower)alkenyl,

- (A17) lower alkylenedioxy,
- (A18) acylamino,
- (A19) nitro,
- (A20) (C6-C10)aryl(lower)alkoxy,
- (A21) carbamoyl(lower)alkenyl optionally N-substituted by the group consisting of lower alkyl, (C6-C10)aryl, lower alkoxy(C6-C10)-aryl, and halo(C6-C10)aryl,
- (A22) lower alkylaminocarbonyloxy,
- (A23) lower alkanoyloxy,
- (A24) lower alkoxy(lower)alkanoyloxy,
- (A25) lower alkoxycarbonyloxy,
- (A26) lower alkenoyloxy optionally substituted by the above heterocyclic group (1),
- (A27) lower cycloalkanecarbonyloxy,
- (A28) lower alkoxy substituted by the group consisting of carboxy, protected carboxy, lower alkanoyl, lower cycloalkanecarbamoyl, and lower alkylcarbamoyl,
- (A29) lower alkylcarbamoyloxy(lower)alkyl,
- (A30) lower alkoxycarbonylamino(lower)alkyl,
- (A31) amino(lower)alkyl,
- (A32) lower alkylcarbamoyl(lower)alkyl,
- (A33) heterocyclic-carbonylamino, the heterocyclic group being selected from the above (2), (4) and (5) and optionally substituted by N-protective group, and
- (A34) the heterocyclic group of the above (7) being optionally substituted by lower alkyl.

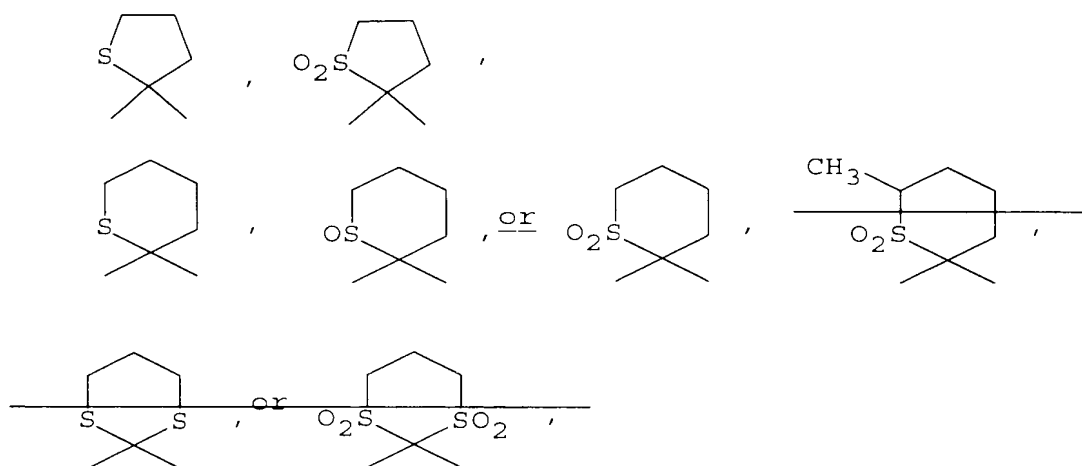
Claim 22 (Currently amended): The compound of claim 21, having the following formula:



wherein a group of the formula:



is one of the following formulae:

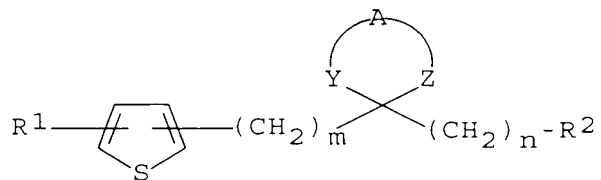


R^1 is lower alkyl, phenyl, halophenyl, or (halo)(phenyl)phenyl,

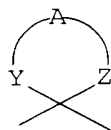
R^2 is carboxy or hydroxyaminocarbonyl, and

m and n are each an integer of 0 or 1, and $m+n=1$.

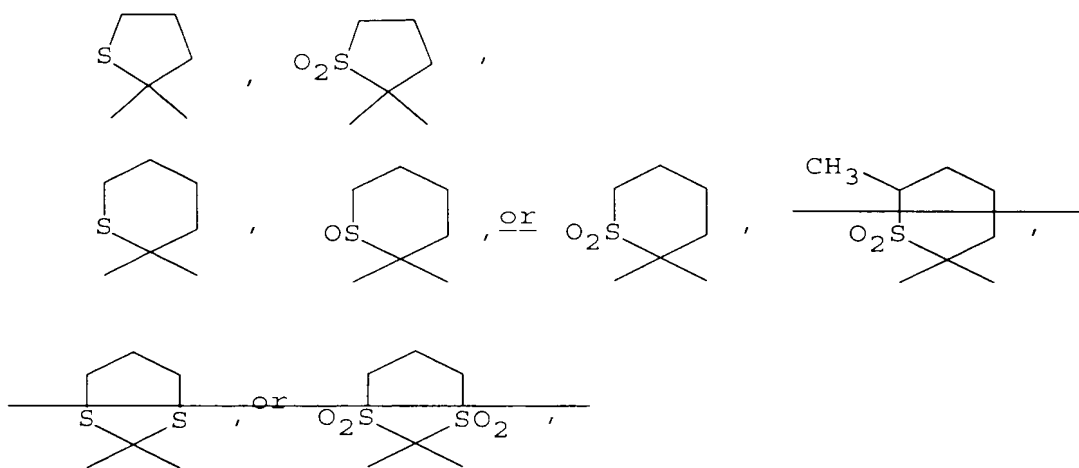
Claim 23 (Currently amended): The compound of claim 21, having the following formula:



wherein a group of the formula:



is one of the following formulae:



R2 is carboxy or hydroxyaminocarbonyl,

m and n are each an integer of 0 or 1, and m+n=1,

R1 is halogen, heterocyclic group selected from the group consisting of

pyridyl, thienyl, furyl, benzofuranyl or benzothienyl, wherein the heterocyclic group is optionally substituted by a group selected from the group consisting of lower alkanoyl, lower alkyl, lower alkoxy, lower alkoxycarbonylamino and lower alkylcarbamoyl; naphthyl or phenyl optionally substituted by a group selected from the group consisting of the following (C1) to (C31):

- (C1) halogen,
- (C2) lower alkyl,
- (C3) lower alkoxy,
- (C4) halo(lower)alkyl,
- (C5) halo(lower)alkoxy,
- (C6) lower alkenyl,
- (C7) lower alkylcarbamoyl, carbamoyl, phenyl(lower)alkylcarbamoyl, lower alkanoyl,
- (C8) lower alkylthio, lower alkylsulfinyl, lower alkylsulfonyl,
- (C9) phenyl, naphthyl,
- (C10) halophenyl,
- (C11) hydroxy,
- (C12) mono- or dihydroxy(lower)alkyl, phenoxycarbonyloxy(lower)alkyl
- (C13) amino,
- (C14) carboxy,
- (C15) lower alkylenedioxy,
- (C16) lower alkanoylamino,
phenyl(lower)alkanoylamino, halophenyl(lower)alkanoylamino,
lower alkoxy(lower)alkanoylamino,
phenoxy(lower)alkanoylamino, lower alkoxyphenoxy(lower)alkanoylamino,

lower alkylphenoxy(lower)alkanoylamino,
halophenoxy(lower)alkanoylamino,
carboxy(lower)alkanoylamino, lower alkoxy carbonyl(lower)alkanoylamino,
lower alkylcarbamoyl(lower)alkanoylamino,
halo(lower)alkanoylamino,
lower alkenyl(lower)alkanoylamino,
lower alkoxy(lower)alkanoylamino,
phenyl(lower)alkoxy(lower)alkanoylamino,
piperidinyloxy(lower)alkanoylamino, N-lower alkoxy carbonylpiperidinyloxy-
(lower)alkanoylamino, pyridyloxy(lower)alkanoylamino,
hydroxy(lower)alkanoylamino,
lower alkanoyloxy(lower)alkanoylamino,
lower alkylcarbamoyloxy(lower)alkanoylamino, N,N-di(lower
alkyl)carbamoyloxy,
piperidino-carbonyloxy(lower)alkanoylamino,
phenyl(lower)alkylcarbamoyloxy(lower)alkanoylamino, lower
alkoxy carbonylamino(lower)alkanoylamino,
amino(lower)alkanoylamino, fluorenylmethoxycarbonylamino(lower)-
alkanoylamino,
lower alkylamino(lower)alkanoylamino, [N,N-di(lower
alkyl)amino](lower)alkanoylamino,
[N-lower alkyl-N-(lower alkoxy carbonyl)-amino](lower)alkanoylamino, [N-
lower alkyl-N-(fluorenylmethoxycarbonyl)amino](lower)alkanoylamino,
[N-lower alkyl-N-(mono- or di(lower)-
alkylcarbamoyl)amino](lower)alkanoylamino,

[N-(mono- or di(lower alkyl)carbamoyl)amino](lower)alkanoylamino,
benzoylamino(lower)alkanoylamino, lower
alkanoylamino(lower)alkanoylamino, lower
alkanesulfonylamino(lower)alkanoylamino,
lower alkoxy(lower)alkanoylamino(lower)alkanoylamino,
cyclo(lower)alkyloxycarbonylamino-(lower)alkanoylamino,
pyridylcarbonylamino(lower)alkanoylamino,
morpholinocarbonylamino(lower)alkanoylamino,
phenyl(lower)alkoxyoxycarbonylamino(lower)alkanoylamino,
lower alkoxyphenylsulfonylamino(lower)alkanoylamino,
hydroxy(lower)alkylamino(lower)alkanoylamino,
morpholino(lower)alkanoylamino, oxooxazolidinyl(lower)alkanoylamino,
oxopyrrolidinyl(lower)alkanoylamino,
trimethylhydantoinyl(lower)alkanoylamino,
lower alkenylamino(lower)alkanoylamino,
lower alkoxy(lower)alkylamino(lower)alkanoylamino,
phenyl(lower)alkylamino(lower)alkanoylamino,
pyridyl(lower)alkylamino(lower)alkanoylamino,
lower alkoxy carbonylamino, phenyl(lower)alkoxy carbonylamino,
lower alkoxy(lower)alkoxy carbonylamino,
halo(lower)alkoxy carbonylamino,
amino(lower)alkoxy carbonylamino, phthalimido(lower)alkoxy carbonylamino,
carbamoylamino,
(mono- or di(lower alkyl)carbamoylamino,
naphthylcarbamoylamino,

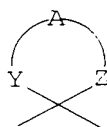
halophenylcarbamoylamino,
lower alkoxyphenylcarbamoylamino,
lower alkenylcarbamoylamino,
cyclo(lower)alkyl(lower)alkylcarbamoylamino,
phenyl(lower)alkylcarbamoylamino,
halo(lower)alkylcarbamoylamino,
lower alkoxy(lower)alkylcarbamoylamino,
hydroxy(lower)alkylcarbamoylamino, (lower
alkyl)(diphenyl)silyloxy(lower)alkylcarbamoylamino,
carboxy(lower)alkylcarbamoylamino, lower
alkoxycarbonyl(lower)alkylcarbamoylamino,
lower alkylcarbamoyl(lower)alkylcarbamoylamino, or
pyridylcarbamoylamino,
lower alkylsulfonylamino,
lower alkenoylamino,
lower cycloalkanecarbonylamino,
lower alkenyloxycarbonylamino,
phenoxycarbonylamino,
lower alkylthiocarbonylamino,

(C17) phenyl(lower)alkoxy,

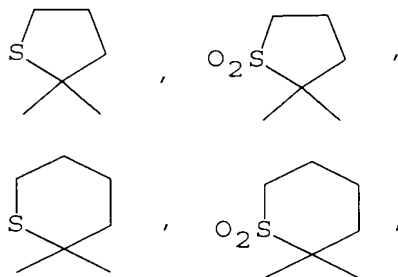
(C18) lower alkenyl, mono- or di(lower alkyl)carbamoyl(lower)alkenyl, (2-
(methylcarbamoyl)ethenyl, 2-(ethylcarbamoyl)ethenyl, 2-
(propylcarbamoyl)ethenyl, 2-(isopropylcarbamoyl)ethenyl, 2-
(dimethylcarbamoyl)ethenyl,) phenylcarbamoyl(lower)alkenyl,

- lower alkoxy carbamoyl(lower)alkenyl,
halophenyl carbamoyl(lower)alkenyl,
(C19) lower alkylaminocarbonyloxy,
(C20) lower alkanoyloxy,
(C21) lower alkoxy(lower)alkanoyloxy,
(C22) lower alkoxy carbonyloxy,
(C23) pyridyl(lower)alkenoyloxy
(C24) lower cycloalkanecarbonyloxy,
(C25) carboxy(lower)alkoxy,
lower alkoxy carbonyl(lower)alkoxy,
lower alkanoyl(lower)alkoxy,
lower cycloalkanecarbamoyl(lower)alkoxy,
lower alkyl carbamoyl(lower)alkoxy,
(C26) lower alkyl carbamoyloxy(lower)alkyl,
(C27) lower alkoxy carbonylamino(lower)alkyl,
(C28) amino(lower)alkyl,
(C29) lower alkyl carbamoyl(lower)alkyl,
(C30) furyl carbonylamino, teretahydroisoquinolyl carbonylamino, N-lower
alkoxy carbonyl-teretahydroisoquinolyl carbonylamino,
pyrrolidinyl carbonylamino,
(C31) oxazolyl, lower alkyloxadiazolyl.

Claim 24 (Currently amended): The compound of claim 23, in which a group of the
formula:



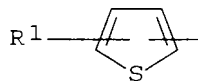
is one of the following formulae:



R^2 is hydroxyaminocarbonyl,

m is 0 and n is 1,

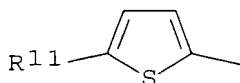
a group of the formula:



~~a group of the formula:~~

is a group selected from the group of the following formulae (a) to (e);

(a)

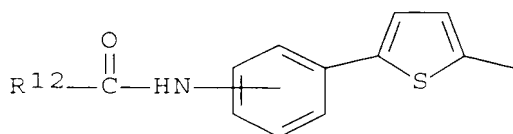


wherein

R^{11} is halo, naphthyl, phenyl, mono- or dihalophenyl, mono- or di(lower)alkylphenyl, lower alkoxyphenyl, trihalo(lower)alkylphenyl, trihalo(lower)alkoxyphenyl, lower alkenylphenyl, lower alkylcarbamoylphenyl, carbamoylphenyl, phenyl(lower)alkylcarbamoylphenyl, lower alkanoylphenyl, lower alkylthiophenyl, lower alkylsulfinylphenyl, lower alkylsulfonylphenyl, phenylphenyl, (halo)(phenyl)phenyl, halophenylphenyl, hydroxyphenyl,

mono- or dihydroxy(lower)alkylphenyl,
phenoxycarbonyloxy(lower)alkylphenyl, aminophenyl, carboxyphenyl, lower
alkylendioxyphenyl, lower alkanesulfonylaminophenyl, lower
alkenoylaminophenyl, lower cycloalkanecarbonylaminophenyl,
phenyl(lower)alkoxyphenyl, mono- or di(lower
alkyl)carbamoyl(lower)alkenylphenyl, phenylcarbamoyl(lower)alkenylphenyl,
lower alkoxycarbamoyl(lower)alkenylphenyl,
halophenylcarbamoyl(lower)alkenylphenyl, lower alkylcarbamoyloxyphenyl,
lower alkanoyloxyphenyl, lower alkoxy(lower)alkanoyloxyphenyl, lower
alkoxycarbonyloxyphenyl, pyridyl(lower)alkenoyloxyphenyl,
cyclo(lower)alkylcarbonyloxyphenyl, carboxy(lower)alkoxyphenyl, lower
alkoxycarbonyl(lower)alkoxyphenyl, lower alkanoyl(lower)alkoxyphenyl,
lower cycloalkanecarbamoyl(lower)alkoxyphenyl, lower
alkylcarbamoyl(lower)alkoxyphenyl, lower
alkylcarbamoyloxy(lower)alkylphenyl, lower
alkoxycarbonylamino(lower)alkylphenyl, amino(lower)alkylphenyl, lower
alkylcarbamoyl(lower)alkylphenyl, furylcarbonylaminophenyl,
1,2,3,4-teretahydroisoquinolylcarbonylaminophenyl, N-t-butoxycarbonyl,
1,2,3,4-teretahydroisoquinolylcarbonylaminophenyl,
pyrrolidinylcarbonylaminophenyl, oxazolylphenyl, lower
alkyloxadiazolylphenyl.

(b)

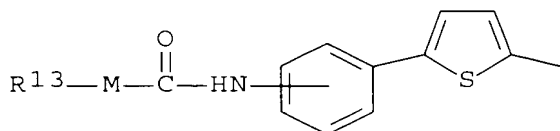


wherein

R¹² is lower alkyl optionally substituted by the group

consisting of phenyl, halophenyl, lower alkoxyphenyl, lower alkoxy, phenoxy, lower alkoxyphenoxy, halophenoxy, lower alkylphenoxy, carboxy, lower alkoxycarbonyl, lower alkylcarbamoyl, halo, lower alkenyloxy, lower alkoxy(lower)alkoxy, phenyl(lower)alkoxy, piperidinyloxy, N-lower alkoxycarbonyl-piperidinyloxy, pyridyloxy, hydroxy, lower alkanoyloxy, mono- or di(lower)alkylcarbamoyloxy, piperidinylcarbonyloxy, phenyl(lower)alkylcarbamoyloxy, lower alkoxycarbonylamino, amino, fluorenylmethoxycarbonylamino, mono- or di(lower)alkylamino, N-lower alkyl-N-(lower alkoxycarbonyl)amino, N-lower alkyl-N-(fluorenylmethoxycarbonyl)amino, N-lower alkyl-N-(mono- or di(lower)alkylcarbamoyl)amino, N-(mono- or di(lower)alkyl)carbamoyl)amino, benzoylamino, lower alkanoylamino, lower alkanesulfonylamino, lower alkoxy(lower)alkanoylamino, cyclo(lower)alkyloxycarbonylamino, pyridylcarbonylamino, morpholinocarbonylamino, phenyl(lower)alkoxycarbonylamino, lower alkoxyphenylsulfonylamino, hydroxy(lower)alkylamino, morpholino, oxooxazolidinyl, oxopyrrolidinyl, trimethylhydantoinyl, pyridyl, lower alkenylamino, lower alkoxy(lower)alkylamino, phenyl(lower)alkylamino, pyridyl(lower)alkylamino, and cyclo(lower)alkyl,

(c)



wherein

M is oxygen or sulfur,

R¹³ is lower alkyl, phenyl(lower)alkyl,

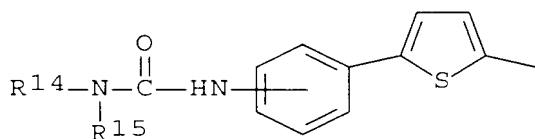
lower alkoxy(lower)alkyl, halo(lower)alkyl,

amino(lower)alkyl, or

phthalimido(lower)alkoxycarbonylamino,

lower alkenyl, phenyl,

(d)



wherein

R¹⁵ is hydrogen or lower alkyl,

R¹⁴ is hydrogen, lower alkyl, naphthyl, halophenyl, lower alkoxyphenyl, lower

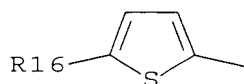
alkenyl, lower cycloalkyl(lower)alkyl, phenyl(lower)alkyl, halo(lower)alkyl,

lower alkoxy(lower)alkyl, hydroxy(lower)alkyl, (lower

alkyl)(diphenyl)silyloxy(lower)alkyl, carboxy(lower)alkyl, lower

alkoxycarbonyl(lower)alkyl, lower alkylcarbamoyl(lower)alkyl, or pyridyl,

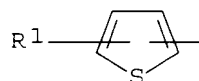
(e)



wherein

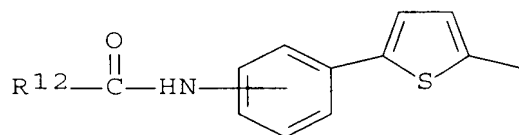
R16 is benzothienyl, benzofuranyl, thienyl, furyl, lower alkylpyridyl, pyridyl, lower alkoxy pyridyl, lower alkoxycarbonylaminopyridyl, lower alkanoylthienyl, lower alkylcarbamoylbenzofuranyl.

Claim 25 (Previously added): The compound of claim 24, wherein
a group of the formula:



is the same group as (a), (c), (d) and (e) of claim 24, and the following formula (b):

(b)



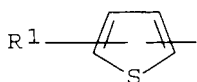
wherein

R¹² is lower alkyl, phenyl(lower)alkyl, halophenyl(lower)alkyl,
lower alkoxyphenyl(lower)alkyl,
lower alkoxy(lower)alkyl, phenoxy(lower)alkyl, lower
alkoxyphenoxy(lower)alkyl, halophenoxy(lower)alkyl,
lower alkylphenoxy(lower)alkyl, carboxy(lower)alkyl,
lower alkoxycarbonyl(lower)alkyl,
lower alkylcarbamoyl(lower)alkyl, halo(lower)alkyl, lower
alkenyloxy(lower)alkyl, lower
alkoxy(lower)alkoxy(lower)alkyl,
phenyl(lower)alkoxy(lower)alkyl, piperidinyloxy(lower)alkyl,
N-t-butoxycarbonylpiperidinyloxy(lower)alkyl, pyridyloxy(lower)alkyl,
hydroxy(lower)alkyl,

lower alkanoyloxy(lower)alkyl,
mono- or di(lower)alkylcarbamoyloxy(lower)alkyl,
piperidinylcarbonyloxy(lower)alkyl,
phenyl(lower)alkylcarbamoyloxy(lower)alkyl,
amino(lower)alkyl,
lower alkoxy-carbonylamino(lower)alkyl,
fluorenylmethoxycarbonylamino(lower)alkyl,
mono- or di(lower)alkylamino(lower)alkyl,
N-lower alkyl-N-(lower alkoxy-carbonyl)amino(lower)alkyl,
N-lower alkyl-N-(fluorenylmethoxycarbonyl)amino-
(lower)alkyl, N-lower alkyl-N-(mono- or di(lower)-
alkylcarbamoyl)amino(lower)alkyl, N-(mono- or di(lower alkyl)carbamoyl)-
amino(lower)alkyl, benzoylamino(lower)alkyl,
lower alkanoylamino(lower)alkyl,
lower alkanesulfonylamino(lower)alkyl,
lower alkoxy(lower)alkanoylamino(lower)alkyl,
cyclo(lower)alkyloxycarbonylamino(lower)alkyl,
pyridylcarbonylamino(lower)alkyl, morpholinocarbonylamino(lower)alkyl,
phenyl(lower)alkoxyoxycarbonylamino(lower)alkyl,
lower alkoxyphenylsulfonylamino(lower)alkyl,
hydroxy(lower)alkylamino(lower)alkyl, morpholino(lower)alkyl,
oxooxazolidinyl(lower)alkyl, oxopyrrolidinyl(lower)alkyl,
trimethylhydantoinyl(lower)alkyl, pyridyl(lower)alkyl, lower
alkenylamino(lower)alkyl, lower alkoxy(lower)alkylamino(lower)alkyl,

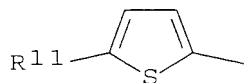
phenyl(lower)alkylamino(lower)alkyl, pyridyl(lower)alkylamino(lower)alkyl, cyclo(lower)alkyl, (amino)(phenyl)(lower)alkylamino, (lower alkoxycarbonylamino)(phenyl)(lower)alkyl, (amino)(lower alkoxy)-(lower)alkyl, (lower alkoxycarbonylamino)(lower alkoxy)(lower)alkyl, (amino)(carboxy)(lower)alkyl, (lower alkoxycarbonylamino)(carboxy)-(lower)alkyl, (amino)(lower alkoxycarbonyl)(lower)alkyl, (lower alkoxycarbonylamino)(lower alkoxycarbonyl)(lower)alkyl, (amino)(phenyl(lower)alkoxy)(lower)alkyl, (lower alkoxycarbonylamino)-(phenyl(lower)alkoxy)(lower)alkyl, (amino)(pyridyl)(lower)alkyl, (lower alkoxycarbonylamino)(pyridyl)(lower)alkyl, (amino)(hydroxy)-(lower)alkyl, (lower alkoxycarbonylamino)(hydroxy)(lower)alkyl, (amino)(amino)(lower)alkyl, (lower alkoxycarbonylamino)(amino)(lower)alkyl, (amino)(lower alkoxycarbonylamino)(lower)alkyl, (lower alkoxycarbonylamino)(lower alkoxycarbonylamino)(lower)alkyl, (amino)(lower cycloalkane)(lower)alkyl, (lower alkoxycarbonylamino)(lower cycloalkane)(lower)alkyl.

Claim 26 (Currently Amended): The compound of claim 24, in which a group of the formula:



is a group selected from the group of the following formula (a) to (e):

(a)



(a)

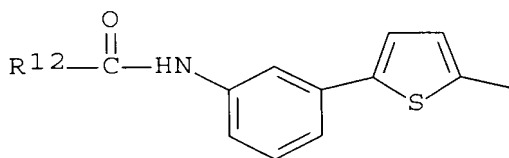
wherein

R11 is bromo, 2-naphthyl, phenyl,
3(or 4)-chlorophenyl, 2(or 3 or 4)-fluorophenyl, 3,4-dichlorophenyl,
3,5-difluorophenyl,
3(or 4)-methylphenyl, 4-ethylphenyl,
4-isopropylphenyl, 4-(t-butyl)phenyl,
3,4-dimethylphenyl, 4-methoxyphenyl,
4-ethoxyphenyl, 4-trifluoromethylphenyl,
4-trifluoromethoxyphenyl, 4-ethenylphenyl,
4-methylcarbamoylphenyl, 4-ethylcarbamoylphenyl,
4-carbamoylphenyl, 4-benzylcarbamoylphenyl,
4-acetylphenyl, 4-methylthiophenyl,
4-ethylthiophenyl, 4-methylsulfinylphenyl,
4-methylsulfonylphenyl, phenylphenyl, 4-phenyl-3-fluorophenyl,
4-(4-fluorophenyl)phenyl, 3(or 4)-hydroxyphenyl, 3(or
4)-hydroxymethylphenyl,
4-(1,2-dihydroxyethyl)phenyl,
4-(phenoxy-carbonyloxymethyl)phenyl, 3(or 4)-aminophenyl,
4-carboxyphenyl,
3,4-methylenedioxyphenyl,
4-(methanesulfonylamino)phenyl,
3-(2-butenoylamino)phenyl,
3-(cyclopropanecarbonylamino)phenyl,
3-(cyclobutanecarbonylamino)phenyl,

3-(cyclopentanecarbonylamino)phenyl,
4-benzyloxyphenyl,
4-(2-(methylcarbamoyl)ethenyl)phenyl,
4-(2-(ethylcarbamoyl)ethenyl)phenyl,
4-(2-(propylcarbamoyl)ethenyl)phenyl,
4-(2-(isopropylcarbamoyl)ethenyl)phenyl,
4-2-(dimethylcarbamoyl)ethenyl)phenyl,
4-(2-(phenylcarbamoyl)ethenyl)phenyl,
4-(2-(methoxyphenylcarbamoyl)ethenyl)phenyl,
4-(2-(4-fluorophenylcarbamoyl)ethenyl)phenyl,
4-(methylaminocarbonyloxy)phenyl,
4-(ethylaminocarbonyloxy)phenyl,
4-propanoyloxyphenyl, 4-(methoxyacetyloxy)phenyl, 4-
(ethoxycarbonyloxy)phenyl,
4-(3-(3-pyridyl)acryloyloxy)phenyl,
4-(cyclopropylcarbonyloxy)phenyl,
4-(carboxymethoxy)phenyl,
4-(ethoxycarbonylmethoxy)phenyl,
4-(t-butoxycarbonylmethoxy)phenyl,
4-(propanoylmethoxy)phenyl,
4-(cyclopropylcarbamoylmethoxy)phenyl,
3(or 4)-(methylcarbamoylmethoxy)phenyl,
4-(ethylcarbamoylmethoxy)phenyl,
4-(propylcarbamoylmethoxy)phenyl,
3(or 4)-(methylcarbamoyloxymethyl)phenyl,

4-(methoxycarbonylaminoethyl)phenyl,
 4-(t-butoxycarbonylaminoethyl)phenyl,
 4-aminomethylphenyl,
 4-(methylcarbamoylmethyl)phenyl,
 3-(2(or 3)-furylcarbonylamino)phenyl,
 3-(1,2,3,4-tetrahydroisoquinolylcarbonylamino)phenyl,
 3-(N-(t-butoxycarbonyl)-1,2,3,4-tetrahydroisoquinolylcarbonylamino)phenyl,
 3-(pyrrolidinylcarbonylamino)phenyl,
 4-(1,3-oxazolyl)phenyl,
 4-(5-methyl-1,2,4-oxadiazol-3-yl)phenyl,

(b)



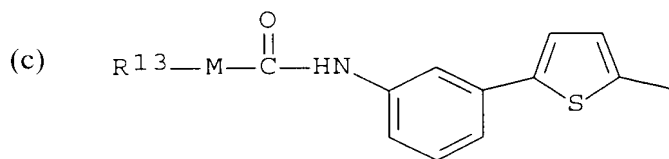
wherein

R¹² is methyl, ethyl, propyl, isopropyl, butyl, isobutyl, t-butyl, neopentyl, phenylmethyl, 4-chlorophenylmethyl, 4-methoxyphenylmethyl, methoxymethyl, ethoxymethyl, propoxymethyl, butoxymethyl, isopropyloxymethyl, 1-methoxyethyl, 2-methoxyethyl, phenoxymethyl, 2-phenoxyethyl, 3(or 4)-methoxyphenoxymethyl, 4-fluoro(or chloro)phenoxymethyl, 3(or 4)-methylphenoxymethyl,

2-carboxyethyl, 2-methoxycarbonylethyl, 2-t-butoxycarbonylethyl,
2-methylcarbamoylethyl,
2-chloroethyl, chloromethyl, allyloxymethyl,
(2-ethoxyethoxy)methyl, benzyloxymethyl,
4-piperidinyloxymethyl, (N-t-butoxycarbonyl-4-piperidinyl)oxymethyl,
3(or4)-pyridyloxymethyl, hydroxymethyl, 2-hydroxyethyl,
acetoxymethyl,
1-acetoxyethyl, methylcarbamoyloxymethyl, 1-(N-methyl-N-
ethylcarbamoyloxy)methyl, (piperidino-carbonyloxy)methyl,
(benzylcarbamoyloxy)methyl,
(t-butoxycarbonylamino)methyl, aminomethyl,
1-aminoethyl, 1-(t-butoxycarbonylamino)ethyl,
2-aminoethyl, methoxycarbonylaminomethyl,
2-(methoxycarbonylamino)ethyl, ethoxycarbonylaminomethyl,
propoxycarbonylaminomethyl,
1-(fluorenylmethoxycarbonylamino)methyl,
2-(t-butoxycarbonylamino)ethyl,
2-(fluorenylmethoxycarbonylamino)ethyl,
1-aminoisopropyl, 1-aminopropyl,
1-(t-butoxycarbonylamino)propyl,
1-(t-butoxycarbonylamino)isopropyl,
1,5-diaminopentyl, 1,5-bis(t-butoxycarbonylamino)-pentyl,
methylaminomethyl, ethylaminomethyl,
(N-methyl-N-ethylamino)methyl,
dimethylaminomethyl, pentylaminomethyl,

t-butylaminomethyl, methylaminoethyl,
3-(2-(N-methyl-N-methoxycarbonylamino)methyl,
1-(N-methyl-N-t-butoxycarbonylamino)methyl,
1-(N-ethyl-N-t-butoxycarbonylamino)methyl,
2-(N-methyl-N-(fluorenylmethoxycarbonyl)amino)-ethyl,
2-(N-methyl-N-(t-butoxycarbonyl)amino)ethyl, 1-(N-methyl-N-
(dimethylcarbamoyl)amino)methyl,
1-(dimethylcarbamoylamino)methyl,
1-(N-(ethylcarbamoyl)amino)methyl,
2-(N-(ethylcarbamoyl)amino)ethyl, benzoylaminomethyl, 2-
benzoylaminoethyl, acetylaminomethyl, isobutyrylaminomethyl,
pivaloylaminomethyl,
1-(methanesulfonylamino)methyl,
2-(methanesulfonylamino)ethyl, methoxyacetylaminomethyl,
cyclopentyloxycarbonylaminomethyl,
pyridylcarbonylaminomethyl, morpholinocarbonylaminomethyl,
benzyloxycarbonylaminomethyl,
1-(4-methoxyphenylsulfonylamino)methyl,
1-(2-hydroxyethylamino)methyl,
morpholinomethyl, 1-(2-oxo-1,3-oxazolidin-1-yl)methyl,
1-(2-oxopyrrolidin-1-yl)methyl,
1-(3,4,4-trimethylhydantoin-1-yl)methyl, allylaminomethyl, 1-(2-
ethoxyethylamino)methyl,
benzylaminomethyl, 1-(3-pyridylmethylamino)methyl,
2-phenyl-1-aminoethyl, 1-amino-1-phenylmethyl,

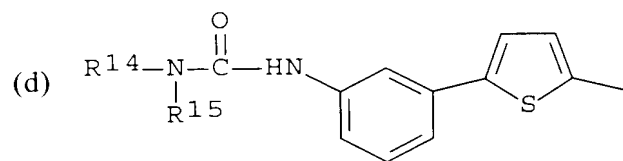
1-t-butoxycarbonylamino-1-phenylmethyl,
1-amino-2-phenylethyl, 1-t-butoxycarbonylamino-2-phenylethyl,
1-amino-2-methoxyethyl,
1-t-butoxycarbonylamino-2-methoxyethyl, 1-amino-3-carboxypropyl,
1-t-butoxycarbonylamino-3-carboxypropyl,
1-amino-3-(t-butoxycarbonyl)propyl,
1-t-butoxycarbonylamino-3-t-butoxycarbonylpropyl, ~~etc.~~, 1-amino-2-benzyloxyethyl,
1-t-butoxycarbonylamino-2-benzyloxyaminoethyl,
1-amino-2-(3-pyridyl)ethyl,
1-t-butoxycarbonylamino-2-(3-pyridyl)ethyl, 1-amino-2-(4-pyridyl)ethyl,
1-t-butoxycarbonylamino-2-(4-pyridyl)ethyl,
1-amino-2-hydroxyethyl,
1-t-butoxycarbonylamino-2-hydroxyethyl,
(1,5-diaminopentyl, 1-t-butoxycarbonylamino-5-aminopentyl,
1,5-bis(t-butoxycarbonylamino)pentyl,
1-amino-5-(t-butoxycarbonylamino)pentyl, 1-amino-2-cyclohexylethyl, 1-t-butoxycarbonylamino-2-cyclohexylethyl,



wherein

M=O and R13 is methyl, ethyl, propyl, isopropyl, benzyl, 2-methoxyethyl, 2-chloroethyl, 2-aminoethyl, 2-phthalimidoethyl, allyl, phenyl, or

M=S and R13 is methyl, ethyl,

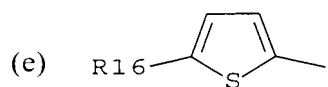


wherein

R15 is hydrogen and

R14 is hydrogen, methyl, ethyl, propyl, isopropyl, butyl, isobutyl, pentyl, hexyl, 1-naphthyl, 3(or 4)-chlorophenyl, 3-methoxyphenyl, allyl, cyclohexylmethyl, benzyl, 2-chloroethyl, methoxymethyl, 2-methoxyethyl, 2-hydroxyethyl, 2-((t-butyl)(diphenyl)silyloxy)ethyl, carboxymethyl, ethoxycarbonylmethyl, methylcarbamoylmethyl, or 3-pyridyl,

R14 is ethyl and R15 is methyl,



wherein

R16 is 2-benzothienyl, 2-benzofuranyl, 2(or 3)-thienyl, 2-furyl, 3-pyridyl, 1-methyl-4-pyridyl, 6-methyl-3-pyridyl, 6-methoxy-3-pyridyl, 5-methoxycarbonylamino-3-pyridyl, 5-acetyl-2-thienyl, 2-methylcarbamoyl-5-benzofuranyl.

Claim 27 (Previously added): A pharmaceutical composition which comprises the compound of Claim 18 or a pharmaceutically acceptable salt thereof and a pharmaceutically acceptable carrier or excipient.

Claim 28 (Previously added): A process for preparing a pharmaceutical composition which comprises admixing the compound of Claim 18 or a pharmaceutically acceptable salt thereof with a pharmaceutically acceptable carrier or excipient.

Claim 29 (Previously added): A method for treating, reducing, arresting, or alleviating matrix metalloproteinases (MMP) or tumor necrosis factor (TNF)-mediated disease, the method comprising administering to a patient a therapeutically effective amount of the compound of Claim 18 or a pharmaceutically acceptable salt thereof.

Claim 30 (Previously added): A method for inhibiting matrix metalloproteinases (MMP) or tumor necrosis factor (TNF), the method comprising administering to a patient an effective amount of the compound of Claim 18 or a pharmaceutically acceptable salt thereof.

Claim 31 (Previously added): A process for manufacturing a medicament, said process comprising contacting the compound of Claim 18 or a pharmaceutically acceptable salt thereof with a pharmaceutically acceptable carrier.

Claims 32-35 (canceled).